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Prevalence of Non-HIV Sexually Transmitted Infections among University Students in Botswana

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ABSTRACT This research studies the prevalence of non-HIV STIs, the level of awareness and sexual behavior of 331 students (129 males and 202 females) aged 17 to 24 years old at the University of Botswana in Gaborone, Botswana. A multi-stage probability proportional to size sampling design was adopted in selecting the sample. The data were collected through a structured self-administered questionnaire. The mean age at first sexual experience was 16.6 years for males and 18.7 for females. Sixty-six percent of the respondents were sexually active at the time of the survey, and out of those sexually active participants, 26.4 percent reported that they tested for non-HIV STI and 6.9 percent were positive. The prevalence rates for some of the more common non-HIV STIs such as gonorrhea, syphilis and HPV were 1.4 percent each, and others such as herpes, chlamydia and trichomoniasis were 0.9 percent each.

INTRODUCTION

Sexually transmitted infections (STIs) constitute the second major cause of disease burden in adolescents and young adults in developing countries (WHO 2005), but in proportion to their prevalence and the health problems they cause, most STIs are rather neglected in public health research. According to WHO (2013) estimates, 500 million new cases of curable STIs such as syphilis, gonorrhea, chlamydia and trichomoniasis occur annually worldwide in people aged 15-49 years old. These estimates do not include HIV and other incurable STIs which adversely affect the lives of individuals and communities. In sub-Saharan Africa, public health research focuses primarily on HIV but less on non-HIV STIs although they constitute serious public health hazards as they may have long-term consequences such as infertility, blindness, infant illness and death, and increased susceptibility to HIV (WHO 2001).

In sub-Saharan Africa, young people (between ages 15-24 years old) reportedly have high rates of various non-HIV STIs such as syphilis, gonorrhea, trichomoniasis, chlamydia trachomatis, bacterial vaginosis and genital herpes virus (Mwakagile et al. 2001; Obasi et al. 2001; Stally 2003; Todd et al. 2004; Mullick et al. 2005; van de Wijgert et al. 2006; Jones et al. 2007; Young et al. 2007; Dude 2011; Okonko et al. 2012) and account for a large burden of the global HIV/STI crises (Dude 2011; Harris et al. 2011). In various studies, non-HIV STIs prevalence among women ranged from two percent to twenty-nine percent for chlamydia trachomatis; ten percent for trichomoniasis and two percent to eight percent for gonorrhea (Glover et al. 2003; Mullick et al. 2005; Jones et al. 2007; Young et al. 2007). Studies of antenatal clinic attendance in sub-Saharan Africa reveal that forty percent of pregnant women had trichomoniasis and bacterial vaginosis while the evidence of syphilis ranged from 2.5 percent to seventeen percent (Mullick et al. 2005; Dude 2011). The prevalence of chlamydia trachomatis was eleven percent among Nigerian females aged 17-19 years and forty-four percent had evidence of a reproductive tract infection (Mmari et al. 2010). Likewise, in rural primary schools in Tanzania it was discovered that 0.3 percent of male pupils and 1.6 percent of females were positive for chlamydia trachomatis and about 12 pupils were positive for gonorrhea (Todd et al. 2004). In Ghana, STIs prevalence

among adolescents was found to be twenty-five percent in males and eight percent in females while in Botswana the proportions were thirteen percent for males and four percent for females (Campbell and Rakgoasi 2002; Glover et al. 2003). The evidence suggests that in sub-Saharan Africa the prevalence of non-HIV STIs is higher in men while in women the prevalence of HIV is higher (Atwood et al. 2011; Dude 2011; Harris et al. 2011), especially in younger women in the age group 15-24 years (Kennedy et al. 2012).

Sexually active adolescents (15-19 years old) and young adults (20-24 years old) are at higher risk for STIs because of a number of psychological, cultural, social, and economic factors. Psychological factors that put adolescents and young adults at increased risk for STIs include their general sense of invulnerability, the desire to try new experiences, and the willingness to take risks, including changing sexual partners often or having a partner who has multiple partners and general non-use or inconsistent use of condoms (Moore and Rosenthal 1991; Hein 1992; Barone et al. 1996; Serovich and Greene 1997; CDC 1998; Agyei et al. 2002; Kaaya et al. 2002; Meekers et al. 2003; Kennedy et al. 2012; Amu and Adegun 2015). Cultural and social factors include adolescents' and young adults' relative lack of power in relationships with sexual partners who are older or higher in social status, which makes them vulnerable to unprotected sexual intercourse and consequently STIs (Campbell and Rakgoasi 2002; Eaton et al. 2003; Glover et al. 2003; Stally 2003; Todd et al. 2004; Atwood et al. 2011; Dude 2011). In addition, economic conditions such as poverty, homelessness, political strife, and dislocation, which are increasingly common among young people in developing countries, lead to sexual abuse or unprotected sexual intercourse exchanged for money or support for basic needs (Atwood et al. 2011).

A number of STI studies in some of the sub-Saharan African countries reveal that adolescents and young adults know little about non-HIV STIs and the signs or symptoms of infection (Awusabo-Asare et al. 2004; Mullick et al. 2005; van de Wijgert et al. 2006; Jones et al. 2007). Some have knowledge of the more common STIs such as syphilis and gonorrhea, however, less is known about other non-HIV STIs including genital herpes, genital warts, human papillomavirus (HPV), trichomoniasis, and chlamydia (Glover et al. 2003; Todd et al. 2004). Without adequate knowledge about non-HIV STIs, young people may not see the need to protect themselves against these infections. Non-HIV STIs also increase an individual's susceptibility to HIV infection (Galvin and Cohen 2004; Kalichman et al. 2011), and among HIV positive people, the viral load is likely to increase once they contract a non-HIV STI (Kalichman et al. 2010). Therefore, research about non-HIV STIs and their prevention is critical and may directly lead to a reduction in HIV infection and/or better health among people living with HIV/AIDS. Since non-HIV STIs affect primarily young men and women who are forming families and contributing to the work force, STIs' societal impact is substantial. Knowing the prevalence of these non-HIV STIs and associated patterns of risk is crucial to ensuring adolescents' and young adults' health and development.

Research Objectives and Hypotheses

It was the aim of this study to investigate non-HIV STIs in Botswana, an upper-middle income country in Southern Africa. Botswana is a sparsely populated country of about two million people but has one of the highest rates of HIV infection in sub-Saharan Africa (UNAIDS 2013). According to the Central Intelligence Agency (2016), the Southern African countries like Botswana (25.16%), Lesotho (23.19%), and South Africa (18.92%) have the highest adult HIV prevalence rates in sub-Saharan Africa. To date, no population-based studies have established the knowledge about and prevalence of non-HIV STIs among young people in Botswana.

The objectives of the study were to collect and analyze data on:

- The knowledge about non-HIV STIs among young people in Botswana;
- The prevalence of non-HIV STIs among sexually active adolescents and young adults in Botswana;
- Their use of condoms to prevent HIV and other STIs, and
- To determine possible gender differences in risky sexual behavior.

The study hypothesized that:

- Respondents who had multiple sexual partners were more likely to have contracted STIs than their counterparts who did not have multiple sexual partners;

- Respondents who used condoms consistently in each episode of sexual encounter were less likely to contract STIs than their counterparts who did not; and
- Male respondents were more likely to engage in risky sexual practices than their female counterparts.

It was anticipated that this study would contribute to a better understanding of the magnitude of the prevalence of non-HIV STIs among young people in Botswana. In addition, it was anticipated that the results would be useful for public health planners, educators, and others involved in designing programs to help youth avoid contracting HIV and other STIs.

METHODOLOGY

Research Design and Sampling Procedure

The study utilized a cross-sectional survey design. The sample size was estimated using Google sample size calculator based on the age distribution of the 2001 Botswana Population and Housing Census; the proportion in the target population estimated to have a particular characteristic (prevalence of STI from previous study) was .171, the ninety-five percent confidence interval, and a margin of error of 0.05 was assumed. The estimated sample size was 562 (324 females and 238 males). Participants were recruited among students enrolled at the University of Botswana in Gaborone, Botswana. Power analysis was adopted from Meinert and Tonascia's (1986) power estimates. It was believed that there were enough number of young people who had contracted non-HIV STIs in the sample to compare them with their counterparts who had not contracted non-HIV STIs. A multi-stage probability-proportional-to-size sampling design was adopted in selecting the sample. On-campus students were stratified by sex and a simple random sampling technique was used to select halls of residence. Ten residential blocks (5 for males and 5 for females) were randomly selected from a total of 46 blocks, and a Kish grid was used to identify eligible students for the survey. Once the eligible students were identified, research assistants were sent to explain the purpose of the research and to tell the prospective respondents what was expected of them, the intended use of the data and the level of confidentiality with which the data will be held.

Ethical approval for the study was obtained from the University of Botswana Institutional Review Board (IRB) and informed consent for participation in the study was obtained from the respondents.

Measurement

The structured self-administered questionnaire contained survey items based on constructs obtained from the review of the literature on non-HIV STIs with particular reference to the developing world and sub-Saharan Africa and probed into respondents' knowledge about non-HIV STIs and their symptoms, sexual activity versus inactivity, number of sexual partners, use/non-use of condoms, intentions to use condoms, and self-reported infection with STIs including HIV status.

Knowledge about STIs was measured through seven items asking whether respondents knew about chlamydia, gonorrhea, HPV, syphilis, trichomoniasis, genital herpes, and yeast infection; answer categories were "Yes, No." An additional four items probed into respondents' knowledge about the contagiousness of non-HIV STIs and their symptoms (that is, discharge, burning sensation, sores); response categories were "True, False, Don't know." Sexual activity items measured were whether or not respondents had engaged in sexual intercourse, the age at which they had their first sexual intercourse, and whether or not they had a steady boyfriend/girlfriend. Concurrent sexual activity was measured through one item ("Apart from your current (dating) partner, do you have sexual intercourse with somebody else?") with response categories as, "Often, Sometimes, Never." Number of sexual partners was measured through one item ("How many sexual partners have you had in the past year?") with response categories "None, One, Two, Three, More than three." Frequency of condom use was measured through one single-item scale ("Are you using any condoms during sexual intercourse?") with response categories as, "Always, Sometimes, Never" and one control item ("Have you recently (in the past month) had unprotected sex?") with response categories as, "Yes, No." Prevalence of non-HIV STIs was measured through respondents' self-reports at nominal measurement level ("Yes, No"), that is, they were asked whether or not they had ever

done a test for non-HIV STIs, whether or not they ever had contracted a non-HIV STI and what type of STI they had contracted.

Data Collection

The data were collected through the self-administered questionnaire in April 2013. Male and female research assistants distributed and collected the research instruments from the eligible students in their respective assigned halls of residence. Appropriate steps were taken to protect the respondents' anonymity and confidentiality. Respondents were informed that the survey was completely voluntary and participation did not affect class performance. Respondents were not to put any identifying information on the survey. Respondents were also informed that they could discontinue the survey at any time or skip any questions. Though the estimated sample size was 562 respondents, only a total of 396 students (202 females and 194 males) volunteered to participate in the survey (response rate: 70.5%). Sixty-five of the returned questionnaires were discarded due to incompleteness. The final sample for data analysis was 331 (202 females and 129 males) respondents aged 17-24 years old with a mean age of 20.1 years (SD = 1.36).

Data Analysis

Data were analysed with SPSS/PASW (version 21). Univariate analysis was utilized to obtain frequencies and percentages and bivariate techniques such as t-test, chi-square analysis (including continuity correction for 2x2 tables), and correlation analysis (Pearson's r) were used to identify differences in the knowledge about and prevalence of non-HIV STIs based on age, gender, sexual activity, and condom use. For purposes of data analysis, items with more than two response categories were recorded into dichotomous response categories. Binary logistic regression analysis was utilized to identify predictors of non-HIV STIs. The five percent significance level (p<0.05) was applied.

RESULTS

Socio-demographic Characteristics and Risk Factors for Non-HIV STIs

The frequency of various socio-demographic variables and risk factors for non-HIV sexually transmitted infections are presented in Table 1. Sixty-one percent of the participants were females with a mean age of 20.2 years and the mean age of male participants was 19.8 years. The age distribution reveals that thirty-seven percent of the participants were adolescents (17-19 years old) and sixty-three percent were young adults (20-24 years old). The mean age at first sexual experience was 16.6 years (SD = 2.46) for males and 18.7 years (SD = 1.68) for females. The

Table 1: Socio-demographic characteristics and risk factors for non-HIV STIs

Characteristics	*Male*		*Female*	
	N	*%*	*N*	*%*
	129	*100.0*	*202*	*100.0*
Age				
17-19	53	43.1	66	32.7
20-24	70	56.9	136	67.3
(6 missing cases)				
Marital Status				
Single Never Married	118	96.7	195	96.5
Cohabitating	4	3.3	1	0.5
Married	0	0.0	6	3.0
(7 missing cases)				
Religion				
None	21	16.3	7	3.5
Christian-Protestant	69	53.5	144	71.3
Christian-Catholic	18	13.9	28	13.9
Other	21	16.3	23	11.4
Sexually Active				
Yes	92	74.2	122	60.4
No	32	25.8	80	39.6
(5 missing cases)				
Condom Use (N = 217)				
Never	1	1.2	2	1.7
Sometimes	25	30.9	36	31.0
Always	55	67.9	78	67.2
(20 missing cases)				
Unprotected Sex in the Past Month (N = 217)				
Yes				
No	21	24.7	47	39.2
(12 missing cases)	64	75.3	73	60.8
Condoms are for Use with Casual Partners (N = 217)				
Yes	52	61.9	61	50.8
No	12	14.3	24	20.0
Don't Know	20	23.8	35	29.2
(13 missing cases)				
Multiple Sexual Partners in the Past Year (N = 217)				
None	9	9.8	5	4.1
1	30	32.6	66	54.5
2	17	18.5	36	29.8
3	10	10.9	8	6.6
>3	26	28.3	6	5.0
(4 missing cases)				

researchers' data revealed that about thirty-nine percent of the sexually active male respondents had multiple (3 or more) sexual partners in the year prior to the study compared to eleven percent for their female counterparts. On the other hand, 39.2 percent of the female respondents had unprotected sex in the month before the survey as compared to 24.7 percent for the male respondents.

Knowledge about Non-HIV STIs

Almost all of the 331 respondents indicated that they knew about syphilis (98.5%) and gonorrhea (97.9%). Slightly fewer respondents knew about HPV (91.2%) and genital herpes (86.1%). Chlamydia was known to 55.3 percent of the respondents, and yeast infection was known to only 37.2 percent. The least known non-HIV STI was trichomoniasis (13.9%). For each respondent, a total score for knowing versus not knowing about these seven non-HIV STIs was computed. The mean score obtained was 4.80 (*SD* = 1.31) with scores ranging from 0 to 7 and a score of 7 indicating knowing about all these non-HIV STIs. As presented in Table 2, Pearson's correlation analysis revealed a low though statistically significant correlation between knowing about non-HIV STIs and age with older respondents knowing more non-HIV STIs than younger ones (r = -.15; p = .006). Independent samples t-tests revealed that females (mean = 5.05; *SD* = 1.37) knew significantly more STIs than males (mean = 4.41, *SD* = 1.10; $t(326) = -4.42$; p = .000). Table 2 shows that sexually active respondents knew about more STIs (mean = 4.93; *SD* =1.31) than non-sexually active respondents (mean = 4.58; *SD* =1.29; $t(327) = 2.29$; p = .023). Respondents who had a steady boyfriend/girlfriend knew significantly more STIs (mean = 4.95; *SD* = 1.31) than respondents who did not have a steady boyfriend/girlfriend (mean = 4.58; *SD* = 1.29; $t(325) = 2.50$; p = .013).

Most respondents (90%) knew about STIs being contagious between sexual partners, and most respondents also knew that discharge from penis/vagina (89.1%), a burning sensation during urination (81.9%), and sores on the penis/vagina (71%) were common symptoms of non-HIV STIs. These four items measuring correct versus incorrect knowledge about non-HIV STIs were computed into one variable, for which a mean score of 3.32 (*SD* = 0.84) was obtained with scores ranging from 0 to 4 and a score of 4 indicating correct knowledge on all four items. Correlation analysis and independent samples t-tests did not reveal any statistically significant results with regard to correct knowledge by age, gender, sexual activity or having a boyfriend/girlfriend (see Table 2).

Prevalence of Non-HIV STIs

About two-thirds of the sample (N=217; 65.6%) reported that they had been sexually active. Only three respondents reported that they were HIV positive and only one of them was sexually active. Of those respondents who were sexually active, 57 (26.4%) reported that they had tested for non-HIV STIs and 15 (6.9%) reported that they had had one or more non-HIV STIs. Most of the latter (N = 12; 5.5%) reported having had a yeast infection while syphilis, gonorrhea, and HPV were reported by three (1.4%) respondents each and herpes, chlamydia, and trichomoniasis by two (0.9%) respondents each. Respondents who had contracted non-HIV STIs did not differ in their knowledge about non-HIV STIs and their symptoms but they were significantly older (mean = 21.50 years; *SD* = 1.79) than respondents

Table 2: Knowledge about non-HIV STIs by age, gender, sexual activity, and steady partner (N = 331)

	Age	*Gender*	*Sexually active vs. not sexually active*	*Steady boyfriend/ girlfriend vs. not*
Knowing about non-HIV STIs	r = -0.15 p = 0.006**	t = -4.42 df = 326 p= 0.000***	t = 2.29 df = 327 p = 0.023*	t = 2.50 df = 325 p = 0.013*
Correct knowledge about non-HIV STI symptoms	r = -0.05 p = 0.343	t = 1.44 df = 326 p = 0.150	t = 0.36 df = 327 p = 0.719	t = -0.56 df = 325 p = 0.577

*p<0.05; **p<0.01; ***p<0.001

who had not had a non-HIV STI (mean = 20.16 years; *SD* = 1.34; *t*(211) = 3.53; *p* = .001). Gender did not result in statistically significant differences in the prevalence of non-HIV STIs ($\chi^2(1)$ = 1.11; *p* = .292).

On average, respondents reported having had (mean =1.81*; SD* = 1.17) sexual partners during the year prior to the study; 45.1 percent of the respondents reported having had one sexual partner, 24.9 percent had two, 8.5 percent had three, and 15.0 percent had more than three sexual partners. The results in Table 3 confirmed the hypothesis that respondents with multiple sexual partners were more likely to have contracted non-HIV STIs than their counterparts who did not have multiple sexual partners. More specifically, respondents who had contracted an STI had significantly more sexual partners (mean = 2.60; *SD* = 1.24) than their counterparts who had not contracted a non-HIV STI (mean = 1.75; *SD* = 1.15; *t*(214) = -2.76; *p* = .006).

A majority of 76.2 percent of the respondents reported that they always planned to use a condom before they had sexual intercourse, and 91.3 percent reported that they planned to use a condom at their next sexual encounter. In spite of such planning, only 67.5 percent of the respondents reported that they always used condoms. Among the latter, 11.9 percent reported that they had unprotected sex during the month prior to the study, which suggests that responses about consistent condom use were unreliable. For further analysis, only the variable measuring unprotected sex was utilized as an indicator of consistent versus inconsistent condom use.

In total, 33.2 percent of the respondents reported unprotected sex in the month prior to the study indicating inconsistent condom use. The results about unprotected sex in the month prior to the study confirmed the hypothesis that respondents who used condoms consistently in each episode of sexual encounter were less likely to contract a non-HIV STI than their counterparts who did not. More specifically, respondents who reported unprotected sex were more likely to have contracted a non-HIV STI ($\chi^2(1)$ = 6.21; *p* = .013).

The hypothesis that male respondents would be more likely to engage in risky sexual practices than their female counterparts was not entirely confirmed. Chi-square analysis did not reveal any difference between male and female respondents' self-reported unprotected sex during the month prior to the study ($\chi^2(1)$ = 2.94; *p* = .086). However, males were more likely to report that they had engaged in concurrent sexual intercourse with somebody other than their dating partner ($\chi^2(1)$ = 36.03; *p* = .000).

Binary logistic regression analysis in Table 3 reveals age and multiple sexual partners as predictors of non-HIV STIs. The odds of respondents who had contracted a non-HIV STI were almost two times higher for respondents who had multiple sexual partners during the year prior to the study (*OR* = 1.99; *CI* = 1.12-3.53; *p* = 0.019). Older respondents also had a significant increase in odds of having contracted a non-HIV STI (*OR* = 1.60; *CI* = 1.10-2.34; *p* = 0.014). Gender and inconsistent condom use did not predict contracting a non-HIV STI.

DISCUSSION

This study aimed at investigating knowledge and the prevalence of non-HIV STIs among young people in Botswana. The results revealed that most respondents knew of the more common STIs such as gonorrhea, syphilis, HPV, and herpes. But knowledge of the less common ones such as chlamydia and trichomoniasis was much lower. These findings are in accordance with what is reported in the literature (Chinsembu 2009; Odaman and Ataman 2010). Females, older and sexually active respondents knew of more

Table 3: Binary logistic regression analysis of predictors of contraction of non-HIV STI

Contraction of non-HIV STI

Predictor	*B*	*(SE)*	*Wald*	*OR (95% CI)*	*p-Value*
Age	0.47	0.19	6	1.60 (1.10 - 2.34)	0.014*
Gender	1.27	0.81	2.41	3.54 (0.72 - 17.48)	0.12
Multiple sexual partners	0.69	0.29	5.5	1.99 (1.12 - 3.53)	0.019*
Unprotected sex	-1.01	0.62	2.65	0.37 (0.11 - 1.23)	0.104

*p<0.05

STIs than males, younger, and sexually inactive respondents respectively. As young people become sexually active and develop in age they are more likely to be exposed to non-HIV STIs and in this way they may increase their knowledge of non-HIV STIs. In this study, most respondents knew about the contagiousness and the common symptom of non-HIV STIs although sores on the penis/vagina as symptoms of non-HIV STIs were not known to almost thirty percent of the sample. These findings suggest the need for more education about non-HIV STIs in the Botswana context.

In this study, only three respondents reported having contracted HIV amounting to less than one percent. The prevalence of non-HIV STIs among sexually active respondents was 6.9 percent. While this prevalence rate appears to be lower than what is reported in some other sub-Saharan African countries (for example, Mmari et al. 2010; Okonko et al. 2012), it still is in the range of non-HIV STI prevalence reported from the region (for example, Agyei et al. 1992; Todd et al. 2004; Jones et al. 2007; Chinsembu 2009; Ataman and Odaman 2011; Masese et al. 2017; Francis et al. 2018). The relatively low prevalence rate in this study could have been impacted by the educational level of the respondents who were all enrolled at a university. Painter et al. (2012) in their study with African-American young adult women found evidence that suggests that college education seems to reduce the vulnerability to non-HIV STIs.

The most prevalent non-HIV STI in the present study was yeast infection while the prevalence of syphilis, gonorrhea, HPV, herpes, Chlamydia, and trichomoniasis was much lower. These results are similar to findings from other studies (for example, Todd et al. 2004; Ataman and Odaman 2011). While various studies report gender differences in the prevalence of the various non-HIV STIs (Agyei et al. 1992; Todd et al. 2004; Jones et al. 2007; Chinsembu 2009; Ataman and Odaman 2011), in this study gender did not contribute to the prevalence of non-HIV STIs. An explanation for this result could be that in Botswana, the literacy rates for males and females 15 years and over are almost equal (males: 80.4%, females: 81.8%). Botswana is one of the countries in sub-Saharan Africa where women have a slight edge over men in terms of literacy rates (Central Statistics Office 2003).

The results about the self-reported prevalence of non-HIV STI, however, have to be treated with caution. It could be that the prevalence in this sample was actually higher as only 26.4 percent reported that they had ever tested for a non-HIV STI. The latter appears similar to the findings of a study by Plattner (2010) with young people in Botswana where two-thirds of the sample reported that they were HIV negative although only 45.8 percent had ever done an HIV test, indicating that those who had not tested merely believed that they had not contracted HIV. Perhaps similarly in the present study, many respondents may have simply assumed that they did not have an STI. At times, STIs lack clear symptoms (Weinstock et al. 2004) and respondents may not have known that they actually had an STI. What makes individuals' assumptions of not having an STI problematic is that they will not seek treatment and that they may spread STIs without being aware of it.

It is well documented in the literature that unsafe sexual behavior predisposes adolescents and young adults to STIs (Kaaya et al. 2002; Eaton et al. 2003; Meekers et al. 2003; Todd et al. 2004). About one-third of the respondents in this study reported that they had unprotected sex during the month prior to the study and they were more likely to be among those who also reported that they contracted non-HIV STIs. While both male and female respondents reported risky sexual behavior in terms of unprotected sex, males displayed more risky behavior than females as they were more likely to report concurrent sexual intercourse with somebody other than their current partner and to have had more than three sexual partners during the year prior to the study. This finding is similar to that reported by Mutinta (2014) for Botswana and South Africa; and Agyei and Abrefa-Gyan (2016) for Botswana.

As hypothesized, the results confirmed that respondents with multiple sexual partners were more likely to report contracting non-HIV STIs than respondents who had none or only one sexual partner. Respondents with multiple sexual partners were almost twice more likely to have contracted a non-HIV STI than those who did not have multiple sexual partners. This result is in accordance with findings from other studies. For example, in a study with African-American adolescent females, Voisin et al. (2013) also found

out that multiple sexual partners increased the odds of contracting an STI by 1.3 times. Age was also identified as a predictor of non-HIV STIs though the odds were slightly lower than for multiple sexual partners. Considering that an increase in sexual partners would also increase the probability of getting in contact with someone who has an STI, and that with increasing age young people are likely to expose themselves to more sexual partners over time, these results do not come as a surprise.

CONCLUSION

In spite of the need for more research, the results of this study indicate that non-HIV STIs are a concern for young people in Botswana. The results suggest that with age, exposure to varying sexual partners and unprotected sex, the risk of contracting STIs increases. Furthermore, the results imply that non-HIV STIs are a relevant topic to be considered in public healthcare. It is observed that STIs research in sub-Saharan African countries is disproportionately focused on HIV/AIDS and this is true for Botswana as well. Because non-HIV STIs increase an individual's susceptibility to HIV infection, research and prevention is critical and may lead to a reduction in the spread of HIV infections.

Non-HIV STIs generally strike young people and treatment is often not sought, whether due to inaccessible, delayed, or inadequate treatment, the impact of these infections on individuals' health is high. When left untreated, non-HIV STIs have been associated with a number of adverse pregnancy outcomes such as stillbirth, preterm birth and low birth weight and long-term consequences which include infertility and blindness. Societal impact of these infections is also substantial since these young people are beginning to form families and contributing to the work force; contracting non-HIV STIs limit their ability to participate in the labor force effectively. Therefore, knowing the prevalence rates of these non-HIV STIs and their associated patterns of risk and addressing them through public health policies is crucial to ensuring adolescents and young adults' health and development in Botswana.

RECOMMENDATIONS

Considering the relatively high level of sexual practices among university students and the subsequent risks of contracting HIV/non-HIV STIs, having unintended pregnancies, abortions, and early childbearing, the students are really faced with serious health problems. Accordingly, efforts should be made by health planners and public health officials in Botswana to encourage and promote research on non-HIV STIs.

The results of this study reveal an urgent need to include non-HIV STIs in the ongoing HIV/AIDS campaign especially school-based HIV/AIDS education programs for secondary school students before they get exposed to the risks of HIV and non-HIV infections.

The University of Botswana should make every attempt to expose students to knowledge about other sexually transmitted infections (apart from HIV/AIDS) and the repercussions of contracting any of those infections. In addition, sexually active students should be encouraged to use condoms as condoms serve a dual purpose of preventing HIV and non-HIV STIs as well as unintended pregnancies. This implies that sexually active students should be taught the proper use of both male and female condoms by the University Health Service.

LIMITATIONS

The study had limitations. The participants were a rather homogeneous group of university students which limited the external validity of the study; the results cannot be generalized to other groups of young people in Botswana. The self-administered questionnaire and the sensitive topic (that is, participants' sexuality and related behaviors) could have compromised the reliability of the data. Participants might have underreported their exposure to STIs. The study did not control for mediating and moderating variables such as psychological, social, and cultural factors. Accordingly, more research is needed to address these limitations.

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